US ERA ARCHIVE DOCUMENT

Enbridge Energy, Limited Partnership 1601 Pratt Avenue Marshall, Michigan



April 6, 2011

Mr. Ralph Dollhopf Federal On-Scene Coordinator and Incident Commander U.S. Environmental Protection Agency 801 Garfield Avenue, #229 Traverse City, MI 49686

Re: In the Matter of Enbridge Energy Partners, L.P., et al,

Docket No. CWA 1321-5-10-001

Dear Mr. Dollhopf:

On April 5, 2011, Enbridge Energy, LP, et al, (Enbridge) received a Conditional Approval from the United States Environmental Protection Agency (U.S. EPA) of the March 31, 2011 Overbank and Poling Reassessment Work Plan (Plan).

Enbridge has finalized the Plan based on the comments received in the U.S. EPA Conditional Approval letter. Therefore, please find the finalized Overbank and Poling Reassessment Work Plan, dated April 6, 2011 enclosed which is being submitted to the U.S. EPA for approval.

A response to comments log is also enclosed for your convenience on the Overbank and Poling Reassessment Work Plan.

If you have any questions, please contact either John Sobojinski at 269.781.1142 or the undersigned at 715.398.4670.

Sincerely,

ENBRIDGE ENERGY, LIMITED PARTNERSHIP By Enbridge Pipelines (Lakehead) L.L.C. Its General Partner

Richard Adams

Vice President, U.S. Operations

CC: Joel W. Kanvik, Enbridge
John Sobojinski, Enbridge
Leon Zupan, Enbridge
Bob Steede, Enbridge
Leslie Kirby-Miles, EPA Region 5
Brian Kelly, EPA Region 5 [kelly.brian@epa.gov]
Jeff Kimble, EPA Region 5 [kimble.jeff@epa.gov]

## RESPONSE TO COMMENTS LOG

Re: U.S. EPA Notice of Conditional Approval of Enbridge Energy, Limited Partnership's March 31, 2011 submittal in response to the Administrative Order issued by U.S. EPA on July 27, 2010, pursuant to §311(c) of the Clean Water Act (Docket No. CWA 1321-5-10-001) and Supplement to the Administrative Order issued by U.S. EPA on September 23, 2010

Based on our review of your letter dated April 5, 2011, we have revised the Overbank and Poling Reassessment Work Plan as noted below. The changes are provided in the attached revised Work Plan and discussed below. Our modifications are outlined in bold and follow the agencies comments from the April 5, 2011 letter.

Pursuant to Paragraph 19 of the July 27, 2010 Order, the above-referenced document ("Overbank and Poling Reassessment Work Plan") is approved with the modifications set forth below.

Specific Comments to the Overbank and Poling Reassessment Work Plan:

- 1. In addition to poling locations included in the "2011 Poling Focus Areas" shown on Attachment A of the Plan, please provide additional poling locations at the following locations:
  - a. Regularly spaced intervals; 100 foot intervals in high sinuosity areas and 500 foot intervals in low sinuosity areas of the river system as defined in the Conceptual Site Model, and potential depositional areas along the river.

Response: Additional poling transects will be selected for high sinuosity and low sinuosity areas defined in the Conceptual Site Model. The poling transects will be selected based on river reaches. A river reach is a section of river that has similar channel characteristics. The channel characteristics evaluated to determine river reaches include: channel width, channel depth, sediment bed type, channel gradient, and geomorphic surfaces (i.e. thalweg, point bar, transverse bar). High sinuosity areas have a greater number of river reaches because there is more variability associated with the channel characteristics. Poling transects will be consistent with fall 2010 poling activities.

b. At locations directed by U.S. EPA including, but not limited to, areas where submerged oil is expected to be present and public access areas.

Response: Additional poling will also be conducted in river areas with minimal or no submerged oil reported in 2010, but where submerged oil may have accumulated since the area was last assessed (e.g. backwaters, oxbows, low gradient areas such as MP 4.25 to Ceresco Dam and MP 14.2 to Kalamazoo River Dam, etc.; Attachment A). Poling activities will also take place in bridge and park/launch public access areas.

- 2. Section 2.3 Staff:
  - a. Please clarify if the boat captain and deck hand are included in the specified crew.

Response: Each river poling reassessment team will have an airboat captain.

## RESPONSE TO COMMENTS LOG

b. Please clarify that the crew also includes 2 representatives from regulatory agencies (*e.g.* U.S. EPA, MDEQ).

Response: Each river poling reassessment team consists of an airboat captain, two Tetra Tech personnel, and two regulatory agency oversight personnel (USEPA and MDNRE).

3. Section 2.5 Data Analysis:

A report documenting the 2011 reassessment activities, findings and specific recommendations for response actions shall be prepared for all areas where recoverable quantities of oil are detected; the report shall be due to the U.S. EPA within 7 business days of completing reassessment activities or by May 20, 2011, whichever occurs first.

Response: A report documenting overbank and poling reassessment activities shall be submitted on May 20, 2011.

- 4. A reassessment tracking system consisting of at least the following components shall be developed, implemented and maintained:
  - a. Tables and maps/figures to track submerged oil poling and overbank assessment activities performed, field measurements, observations and findings.

Response: A tracking spreadsheet will be created for submerged oil poling and for the overbank assessment activities. Tracking spreadsheets and maps/figures will be submitted on a daily basis to Ralph Dollhopf, U.S. EPA and Marc DuCharme and Mike Alexander (at a minimum) during reassessment activities. Tracking spreadsheets and maps/figures updates sent out on a daily basis will be updated for the previous day's activities.

b. Tracking tables and maps/figures shall be distributed to Ralph Dollhopf, U.S. EPA and Marc DuCharme and Mike Alexander, MDEQ personnel daily during reassessment activities.

Response: A tracking spreadsheet will be created for submerged oil poling and for the overbank assessment activities. Tracking spreadsheets and maps/figures will be submitted on a daily basis to Ralph Dollhopf, U.S. EPA and Marc DuCharme and Mike Alexander (at a minimum) during reassessment activities. Tracking spreadsheets and maps/figures updates sent out on a daily basis will be updated for the previous day's activities.

c. Removal response recommendations shall be included in the summary tables.

Response: The main focus of this Reassessment is to collect information to subsequently develop appropriate response activities. If areas of high risk areas are discovered, appropriate response activities will implemented as soon as possible. Such areas and recommended response activities will be discussed at the 1700 Operations Meeting as appropriate.

## RESPONSE TO COMMENTS LOG

d. Since some oil removal methods are dependent on water depth, contingency removal response actions shall also be included to provide response actions with varying or different water levels that may be encountered during response actions.

Response: See response to 4c. Contingency responses will be presented for removal response actions shall be presented and discussed.

- 5. Section 3.1, Objectives:
  - a. Second bullet: Assessment of areas identified by Fluorescent Light Detection and Ranging (FLS) shall be performed by different personnel with the intent of performing a biased assessment in areas of identified oil.

Response: Assessment of areas identified by FLS will be performed by different personnel to perform a biased assessment in areas of identified oil.

6. Please schedule a regular daily meeting for coordination of efforts and data sharing between the following operational groups during all reassessment activities: Poling Reassessment Group, O&M Group, and Overbank Reassessment Group.

Response: Daily meetings for coordination of efforts and data sharing between the operational groups will be discussed during the daily 1700 Operations Meeting. The data shared at this meeting will be data collected from the previous day's activities.

The revised Overbank and Poling Reassessment Work Plan, as modified above, shall be submitted to U.S. EPA no later than 17:00 hours Eastern, April 6, 2011. The document shall also be concurrently submitted electronically in Microsoft Word format.

## **Enbridge Line 6B MP 608 Marshall, Michigan Pipeline Release**

Supplement to the Response Plan for Downstream Impacted Areas and the Source Area Response Plan

Commonly Referred to as the "Overbank and Poling Reassessment Work Plan"

**Enbridge Energy, Limited Partnership** 

March 14, 2011 Revised March 31, 2011 Revised April 6, 2011

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Table 2011 Poling Assessment Table

Table Submerged Oil Field Observation Flowchart

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#### **SECTION 1 INTRODUCTION**

This Supplement to the Response Plan for Downstream Impacted Areas and the Source Area Response Plan (Overbank and Poling Reassessment Work Plan) is in response to the requirements of the United States Environmental Protection Agency (U.S. EPA) Notice to Enbridge dated March 7, 2011. The notice directs Enbridge to perform assessment activities pursuant to the Administrative Order issued by the U.S. EPA on July 27, 2010 and a Supplement to Order for Compliance under Section 311(c) of the Clean Water Act issued ("Supplement") by the U.S. EPA on September 23, 2010. Paragraph 6 (Item 18.k) of the Supplement requires that Enbridge submit a detailed plan to the U.S. EPA for reassessment of the source area, Talmadge Creek, Kalamazoo River and downstream impacted areas for the presence of oil, sheen, and/or oil/sheen that threatens navigable waterways.

This Work Plan includes a detailed methodology (e.g., visual assessment/inspection, poling, etc.) to evaluate the impacted waterways (including sediment and soil), shorelines and downstream impacted areas. The work plan also includes a proposed schedule for plan implementation. The provisions and details for collecting aerial imagery data of areas affected or suspected to be affected by the spill will be provided to U.S. EPA as a separate work plan. Together, the work plans will meet the directives as detailed in the Notice.

#### SECTION 2 SUBMERGED OIL AND SEDIMENT REASSESSMENT

## 2.1 Objectives

Poling in 2010 was used in both pre-remediation and post-remediation activities. Poling was used to characterize pre-remediation areas with a focus on depositional areas defined during the geomorphic analysis and also selected river section areas that are representative of no or slight impact from the oil release. During remediation, poling was used to assess the progress and effectiveness of the remediation techniques. After remediation, poling (and visual observations) was the primary method of determining if remediation work in a given area was complete. Poling work will be used in a similar fashion in 2011, and will include the following objectives:

- Determine the 2011 submerged oil deposition pattern.
- Determine the observed physical characteristics of submerged oil (e.g. sheen, globules) relative to submerged oil observed during the 2010 field season.
- Compare the 2010 and 2011 submerged oil deposition pattern.

Several information sources will be used to determine areas for reassessment. These sources include:

- Geomorphic setting.
- Operations and Maintenance (O&M) tracking table.
- 2010 Submerged Oil Recovery Summary Report.

- Qualitative coring data results, including historic data and the February 2011 Talmadge Creek assessment data.
- Existing ecological assessment data.

The poling and surveying methods used to achieve these objectives are provided in the Assessment Procedures section. The Data Analysis section describes how this poling data will be used to select additional sediment sampling locations for the 2011 field season.

## 2.2 Locations

Poling will be conducted in all areas where moderate or heavy submerged oil was identified during the 2010 emergency response period, including all Submerged Oil Task Force (SOTF) priority areas, O&M submerged oil sites, and submerged oil winter work sites (Attachment A). Additional poling transects will be selected for high sinuosity and low sinuosity areas defined in the Conceptual Site Model. The poling transects will be selected based on river reaches. A river reach is a section of river that has similar channel characteristics. The channel characteristics evaluated to determine river reaches include: channel width, channel depth, sediment bed type, channel gradient, and geomorphic surfaces (i.e. thalweg, point bar, transverse bar). High sinuosity areas have a greater number of river reaches because there is more variability associated with the channel characteristics. The poling transects will be consistent with the fall 2010 poling assessment. Additional poling will also be conducted in river areas with minimal or no submerged oil reported in 2010, but where submerged oil may have accumulated since the area was last assessed (e.g. backwaters, oxbows, low gradient areas such as MP 4.25 to Ceresco Dam and MP 14.2 to Kalamazoo River Dam, etc.; Attachment A). Poling activities will also take place in bridge and park/launch public access areas.

For all these areas, crews will visually assess the area and select representative poling locations. The attached table (Attachment A) shows the minimum number of poling locations for each area. Additional locations will be poled if moderate or heavy submerged oil is detected during the initial assessment (Table, Attachment A). An approximate number of poling locations for delineation of moderate and heavy submerged oil are included for each area. This number of poling locations will vary based on field conditions. Because geomorphic conditions differ between Talmadge Creek, the Kalamazoo River, and Morrow Lake, slightly different methods are required to assess oil deposition for each area. The following section describes these methods.

#### Talmadge Creek

Desktop mapping alone is not sufficient to characterize deposition areas in Talmadge Creek using aerial photographs due to the limited area (small scale) associated with the tributary. Therefore, a crew wearing waders will walk the channel and delineate geomorphic surfaces using GPS technology. This will allow a qualified geomorphologist to determine where concurrent poling activities should be conducted to assess the spatial distribution of submerged oil.

#### Kalamazoo River

Detailed geomorphic mapping of the Kalamazoo River, using aerial photographs and the 2010 poling data, will be completed prior to 2011 sample location selection. Geomorphic mapping of in-channel

geomorphic surfaces is integral in determining where sampling activities will be conducted in 2011 because efforts are focused on depositional areas. The poling activities will be conducted using air boats and 2-person crews. (Attachment A).

#### Morrow Lake

Geomorphic mapping of Morrow Lake, using bathymetry, aerial photographs, and poling data, was completed in 2010. The 2011 poling activities will determine the presence and relative amount of submerged oil at the mouth of the Kalamazoo River into Morrow Lake (Attachment A). The collected data will be compared to the 2010 results from this area.

Figures illustrating the locations of the anticipated poling are presented in Attachment A. The table presented in Attachment A shows the minimum number of proposed poling locations for each area.

#### 2.3 Staff

Tetra Tech will have 3 or more airboat teams, on the Kalamazoo River, a 2 person team on the Talmadge Creek and a GIS team. Team members were on previous submerged oil assessment teams. For example, one airboat team consists of an airboat captain, two Tetra Tech personnel, and two regulatory agency oversight personnel (USEPA and MDEQ).

## 2.4 Assessment Procedures

Global Positioning System (GPS) coordinates, water depth, advancement depth, soft sediment thickness, bed characteristics, presence/absence of oil, and relative amount of oil will be documented at each location. The following procedures will be followed:

Water depth (i.e. depth to sediment surface) is the first measurement at each poling location. To measure water depth, a 6-inch diameter disk is attached to the end of a pole graduated with 0.1-foot intervals. The pole is gradually lowered to the top of the sediment bed. Next, the thickness of soft sediment is measured. A pole without a disk (approximately 2 inches in diameter) with maximum graduations of 0.1 feet will be pushed vertically through the sediment until advancement is restricted. The depth to sediment surface (water depth) and maximum poling depth into the soft sediment will determine the soft sediment thickness at each location.

To determine the amount of submerged oil at each location, a pole with a 6-inch diameter disk attached at the base will be used to agitate the soft sediment. The degree of oil observed at the water surface after agitation will be described using the same categories as the established 2010 classification process (heavy, moderate, slight, or none). These categories are outlined in the classification flow chart presented in Attachment A.

The extent of submerged oil will be delineated when moderate or heavy sheen is observed in a target depositional area. The delineation will extend until none or slight sheen is observed. The field crew will use the following criteria to determine the number of poling locations to sufficiently describe the area:

- Geomorphic river setting
- Size of area

Amount of observed sheen

In the event that oil and/or sheen is generated during reassessment activities, the following procedures will be used:

- In Talmadge Creek, a two-person oil collection crew will accompany each poling crew. The
  collection crew will be positioned downstream of all poling activities with absorbent pads and
  boom to deploy if recoverable oil is released.
- In the Kalamazoo River, each poling airboat will be accompanied by a second airboat with a similar oil collection crew.

Electronic field data forms will serve as a daily record of events, observations, and measurements during all field activities for the poling assessment. All information relevant to poling activities will be recorded electronically on these forms. Entries on these forms will include:

- Names of field crew
- Location of poling activity
- Area Description
- Field measurements
- Field observations
- Photographs

Paper copies of the field forms will be printed and filed for hard copy backup of all data collected. In addition, all electronic data will be added to a database at the end of each work day and stored in a Geographic Information System (GIS) database.

A series of maps will be developed to display the results of poling data. Poling locations and the associated relative oil concentrations will be plotted on the maps. The maps will allow a comparison of the observed 2010 and 2011 depositional patterns.

## 2.5 Data Analysis

A 2011 Submerged Oil Reassessment Report will be prepared to document the poling locations, assessment procedures used, and submerged oil presence results.

The report will include a series of maps that display the results of poling activities. The poling locations and the associated relative oil concentrations will be plotted on the maps. The maps will allow a comparison of the observed 2010 and 2011 depositional patterns. This comparison may provide an understanding of the relationship between river stage and the transport of submerged oil and will be used to update the conceptual site model.

The physical characteristics of the submerged oil (observed during poling activities) will be documented and communicated to the Operations group, since changes in the physical characteristics of the oil may influence remediation techniques.

#### SECTION 3 OVERBANK AND SHORELINE REASSESSMENT

## 3.1 Objectives

The shorelines and floodplains within the Talmadge Creek and Kalamazoo River downstream impacted areas will be reassessed. The assessment area will encompass all areas inundated at the time of the spill as defined by the United States Geological Survey (USGS) Inundation Model (for most of Calhoun County) and the Federal Emergency Management Agency 100 year flood elevation (for the portion of Calhoun County and Kalamazoo County not included in the USGS model). In addition, previous SCAT data, aerial photography (both existing and proposed), and the new LIDAR information proposed will be used to define the area boundaries to be assessed. The objective is to determine the presence of oil along the shoreline and overbank area from Talmadge Creek (starting at MP 0) to the dam at Morrow Lake. Reassessment activities will include the following objectives:

- To verify previously identified Shoreline Cleanup Assessment Technique (SCAT) points identified between the initial release and September 27, 2010 that have remained in the signatory sign-off process.
- To assess areas/locations identified using the Fluorescent LIDAR System, if any. Assessment
  of areas identified by FLS shall be performed by different personnel with the intent of performing
  a biased assessment in areas of identified oil.
- To assess areas / locations that do not contain previously identified SCAT points that are found to have been inundated through the Light Detection and Ranging (LIDAR) Imagery data that will be collected to complete the United State Geological Survey (USGS) Inundation Model.
- Existing documentation for the river cleanup including:
  - The current Operations and Maintenance (O&M) tracking table.
  - o 2010 Submerged Oil Recovery Summary Report
  - 2010 SCAT Assessment Data and Report
  - Qualitative coring data results including historic data as well as February 2011 Talmadge Creek assessment data.
  - Other data sources (e.g., winter work site reports)

#### 3.2 Assessment Metrics

Metrics of successful cleanup for a contaminated SCAT point or zone vary depending on bank or habitat type and degree of oiling. They are defined as follows:

- Riparian Zones and Stream Banks
  - Shorelines no longer release sheens that affect navigable waterways
  - Oil no longer removes readily on contact
  - Oil removal to the point where recovery/re-colonization can occur without causing more harm than leaving the oil in place
- Soil, Sand and Gravel
  - Oil no longer visible on surface
- Man-Made Structures
  - Structure no longer generates liquid oil or sheen
  - o Oil no longer removes readily on contact

These metrics will be assessed by visual field screening for the presence of materials capable of producing a release of oil or oil sheen. Visual screening does not include additional screening tests, such as organic headspace (using a photo-ionization detector [PID]) or detecting a petroleum odor. Residual impacts will be addressed as part of a long-term assessment and remediation effort (conducted pursuant to the State of Michigan Consent Order) for the site.

## 3.3 Staff and Training

An anticipated 5 to 6 teams of 3 to 4 individuals (Enbridge personnel and contractors) are being assembled to complete these activities, In addition, provisions for up to 2 agency representative personnel team will be coordinated by Enbridge. Teams will consist of individuals either familiar with petroleum cleanup activities to include the initial SCAT process. In addition, a 2 day training event is being planned prior to initiating the assessments activities which will be open to the agencies. The training will encompass water safety, objectives, data collection procedures, quality control, documentation, and other aspects related to the re-assessment process.

#### 3.4 Assessment Procedures

National Oceanic and Atmospheric Administration (NOAA) devised the SCAT survey system for rapid assessment of oil impact to shoreline habitats in a marine setting, and the assessment procedure will be based on the SCAT process utilized for this assessment of a riverine environment. Surveys will be conducted by boat and/or foot and target shoreline and accessible overbank areas. Shorelines will be identified in the cleanup reports as "Left Descending Bank (LDB)", or "Right Descending Bank (RDB)". All previously identified SCAT points currently are marked with a wooden stake with a multitude of colored flagging (including red, yellow, green, blue and pink). Reassessment activities were developed using previously collected information including the 2010 SCAT Assessment Data and Report, the Operations and Maintenance (O&M) tracking table, the February 2011 Talmadge Creek assessment data, and O&M Excavation work plan assessment.

The following procedures will be followed:

- Identify and estimate the areas (labeled numerically so not to conflict with initial SCAT efforts in 2010) of specific oiling and substrate conditions found at each previously identified SCAT point or area.
- Areas found to have been inundated by the USGS Inundation Model that does not contain previously identified SCAT points within each 0.25-mile segment of river.
- Characterize oiling conditions and substrate types using a standardized terminology (Shoreline Oil Terminology / Codes for Oil Spills of Black Oil included in Attachment B).
- Characterize shoreline and overbank habitat types and the degree and characteristics of any oiling conditions.
- Assess islands containing previously identified SCAT points; and other islands which do not contain previously identified SCAT points, but have the potential for oil.
- Record percent cover of a specific oiling condition within a SCAT point/zone on SCAT field maps and data collection forms.
- Collect a waypoint and/or polygon, using a GPS unit with sub-meter accuracy, for each of the oiled points/zones identified as having visible oil and/or sheen that is affecting or threatening navigable waterways. The extent of residual oil will be flagged for ease of future identification.

Unlike the previous SCAT effort which limited their assessment to a set distance back from the shoreline, the proposed assessment area will encompass all areas inundated at the time of the spill as defined by the USGS Inundation Model (for most of Calhoun County) and the Federal Emergency Management Agency 100 year flood elevation (for the portion of Calhoun County and Kalamazoo County not included in the USGS model). In addition, previous SCAT data, aerial photography (both existing and proposed), and the new LIDAR information proposed will be used to define the area boundaries to be assessed.

Cleanup recommendations will not be provided at this time; this is strictly reassessment of the shoreline and overbank that has been affected by the release. If an area is found to contain contamination, an evaluation will be made whether the area can be addressed using the approved O&M tool box methods or an area specific work plan will be developed.

Observations may be captured on field forms or in digital tablets (Trimble YUMA), as well as on hand-drawn field sketches. Assessment procedures will reference the 2010 SCAT Assessment Data and Report and the Downstream Impacted Area Response Plan as applicable. The field form will contain a signatory area for the Enbridge representative and U.S. EPA representative to verify the data collected on the sheet is accurate. Assessment data will be provided as a deliverable document. The reassessment deliverable document will provide the following:

Aerial maps with GPS points and polygons collected by the assessment teams.

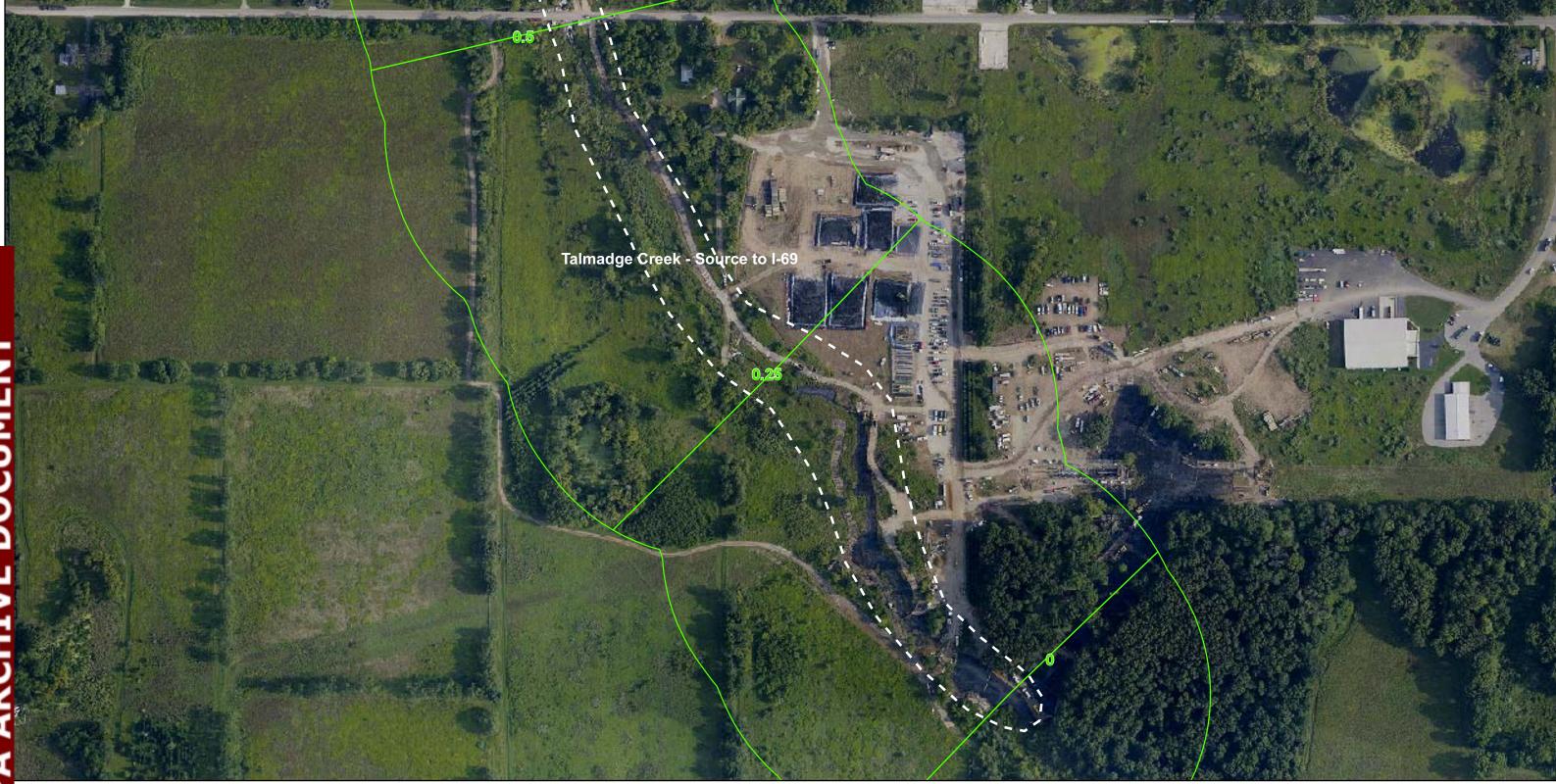
- A table describing the SCAT points / zones and degree or oiling, if any.
- Field data sheets and field sketches showing the area of the assessment point / zone.

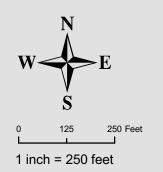
Site sign off will be documented through the field data sheets. At the end of each working day, the assessment team will verify that all data collected on the field forms for each 0.25 mile segment is accurate. Each member will then sign in their respective space. These signatures are only to verify the information gathered during the assessment (whether an area or point contains oil or not). Any areas or points that need to be further evaluated or remediated will be completed using the approved O&M tool box methods or a work plan will be developed for agency approval.

#### **SECTION 4 SCHEDULE**

The work outlined above is proposed to commence after receipt of an approved work plan. The U.S. EPA will be notified of the specific start date and time per Gantt Chart acceptance at the operations meeting. Agencies (including the U.S. EPA, Michigan Department of Environmental Quality (DEQ), U.S. Fish and Wildlife, and the National Oceanic and Atmospheric Association (NOAA), will be given at least 7 day notification of the start of the assessment. In addition, open lines of communication will be maintained, through regular daily meetings. Commencement of the proposed activity will ultimately be determined by weather and seasonal river conditions. Should weather or river conditions create an adverse obstacle to completion of the subject activities, the agencies will be notified of such conditions and their impact on completion of proposed activities. The goal is to complete the shoreline assessment prior to Spring 2011 vegetation/leaf growth. Submerged oil and sediment schedule is projected to start at a later date to allow sufficient time to achieve an optimal water temperature to conduct poling activities. A proposed schedule is attached in Attachment B. A report documenting reassessment activities or by May 20, 2011, whichever occurs first.

# ATTACHMENT A





## Legend

Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

Park/Launch Access Poling Areas

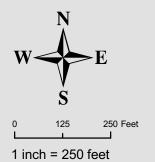
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

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Aerial Photography from August 26 and September 29, 2010

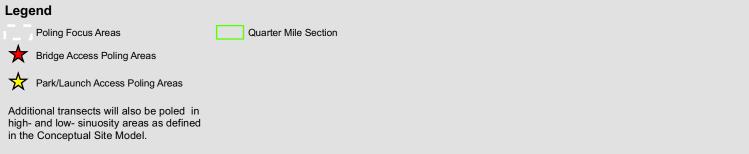
2011 POLING FOCUS AREAS MP00.00-MP00.50

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





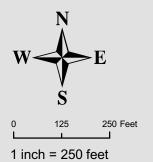
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Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP00.50-MP01.25

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





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Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

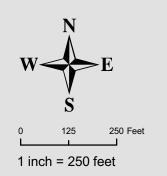
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP01.25-MP02.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN







Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

Park/Launch Access Poling Areas

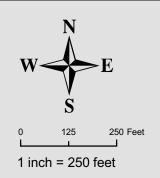
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

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ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN







Legend

Poling Focus Areas

Bridge Access Poling Areas

Quarter Mile Section



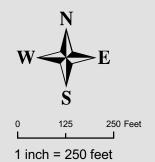
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet
Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP03.00-MP04.00

**ENBRIDGE LINE 6B RESPONSE** KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Bridge Access Poling Areas

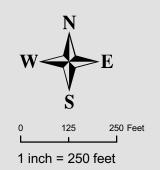
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Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 





Legend

Poling Focus Areas

Bridge Access Poling Areas



Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Quarter Mile Section

2011 POLING FOCUS AREAS MP04.50-MP05.25

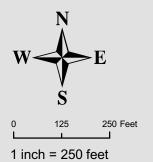
ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 

Apr 06, 2011



TETRATECH EC, INC.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010





Bridge Access Poling Areas



Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

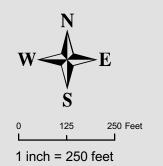
ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN

Apr 06, 2011

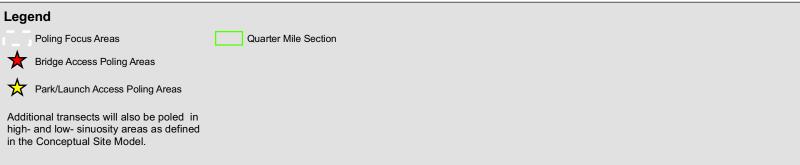


TETRATECH EC, INC.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010



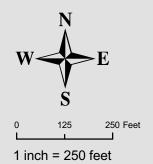
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Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP06.00-MP07.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Bridge Access Poling Areas

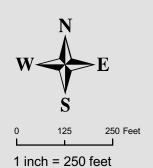
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 





Poling Focus Areas

Bridge Access Poling Areas



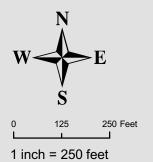
Park/Launch Access Poling Areas

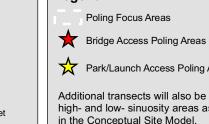
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN







Poling Focus Areas

Quarter Mile Section

Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

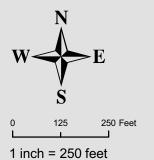
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ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 

Apr 06, 2011



TETRATECH EC, INC.



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Park/Launch Access Poling Areas

Bridge Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Legend
Poling Focus Areas
Quarter Mile Section

Quarter Mile Section

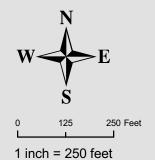
2011 POLING FOCUS AREAS MP09.25-MP10.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN

Apr 06, 2011



Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010



## Legend

Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

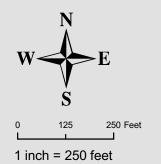
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

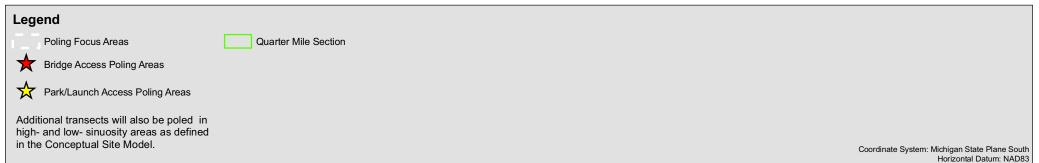
Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP10.00-MP10.75

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





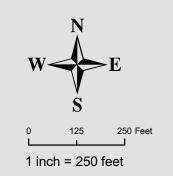
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Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP10.75-MP11.50

ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN







Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

Park/Launch Access Poling Areas

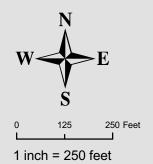
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP11.50-MP12.25

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 







Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas



Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

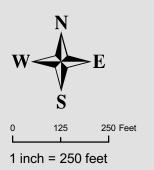
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2011 POLING FOCUS AREAS MP12.25-MP13.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 







Legend

Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

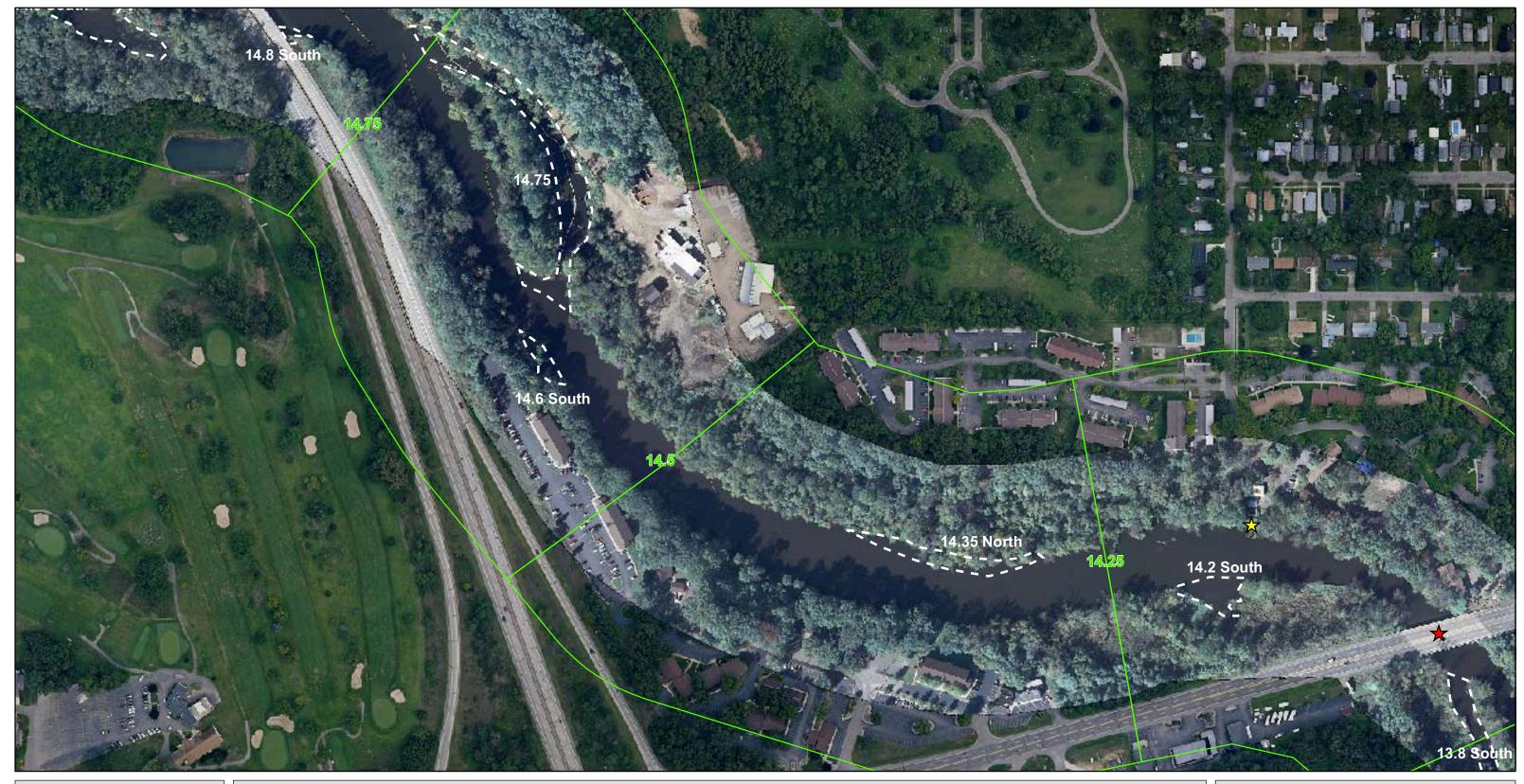
Park/Launch Access Poling Areas

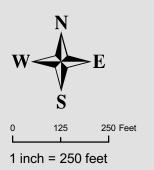
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP13.00-MP14.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN







Legend

Poling Focus Areas Bridge Access Poling Areas Quarter Mile Section

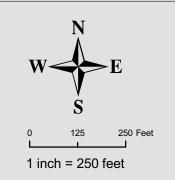
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP14.00-MP14.75

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





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Legend

Poling Focus Areas

Bridge Access Poling Areas

Quarter Mile Section

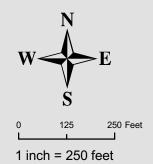
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP14.75-MP15.50

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 





Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

Park/Launch Access Poling Areas

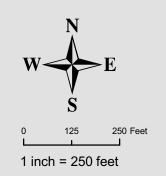
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP15.25-MP16.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 





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Legend

Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas



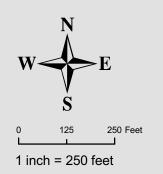
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP16.00-MP16.50

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 





Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

Park/Launch Access Poling Areas

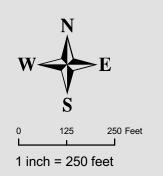
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP16.50-MP17.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





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Legend

Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

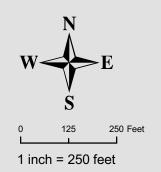
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD83 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP17.00-MP17.75

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





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Legend

Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas



Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

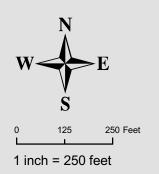
2011 POLING FOCUS AREAS MP17.75-MP18.25

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 

Apr 06, 2011



TETRATECH EC, INC.



# Legend

Poling Focus Areas



Quarter Mile Section



Bridge Access Poling Areas



Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

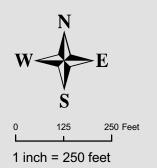
2011 POLING FOCUS AREAS MP18.25-MP19.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 

Apr 06, 2011



TETRATECH EC, INC.



Poling Focus Areas

Bridge Access Poling Areas

Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Quarter Mile Section

2011 POLING FOCUS AREAS MP19.00-MP19.75

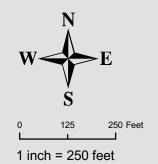
ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN

Apr 06, 2011



TETRATECH EC, INC.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010





Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Legend

Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

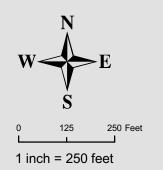
Park/Launch Access Poling Areas

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP19.75-MP20.50

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 







Poling Focus Areas

Bridge Access Poling Areas

Quarter Mile Section

Park/Launch Access Poling Areas

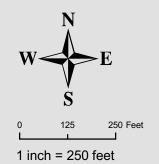
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP20.50-MP21.25

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Poling Focus Areas

Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

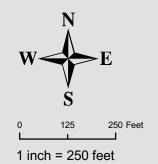
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP21.25-MP22.25

ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN





Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Poling Focus Areas

Bridge Access Poling Areas

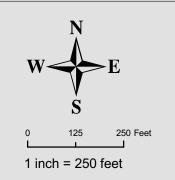
Park/Launch Access Poling Areas

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP22.25-MP23.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Poling Focus Areas

Bridge Access Poling Areas

Quarter Mile Section

Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

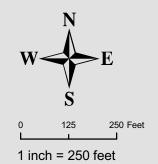
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2011 POLING FOCUS AREAS MP23.00-MP24.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES **MICHIGAN** 







Poling Focus Areas

Bridge Access Poling Areas

Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

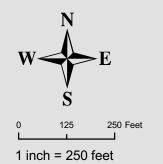
Quarter Mile Section

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP24.00-MP24.75

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN







Poling Focus Areas

Bridge Access Poling Areas

Quarter Mile Section

Park/Launch Access Poling Areas

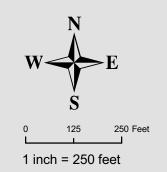
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

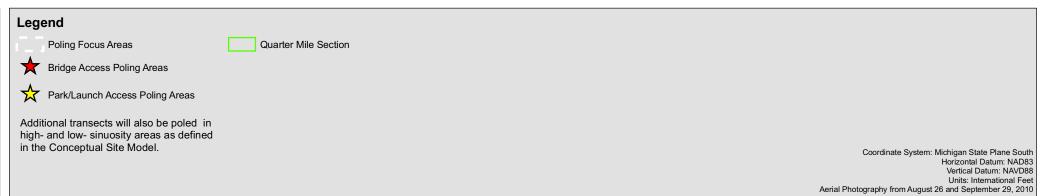
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2011 POLING FOCUS AREAS MP24.75-MP25.75

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN

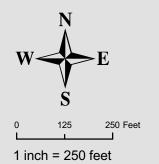


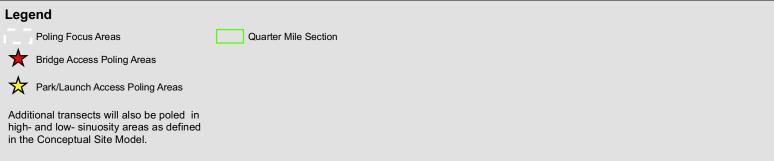




MP25.50-MP26.50
ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN
Apr 06, 2011



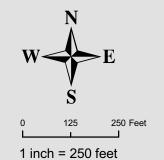


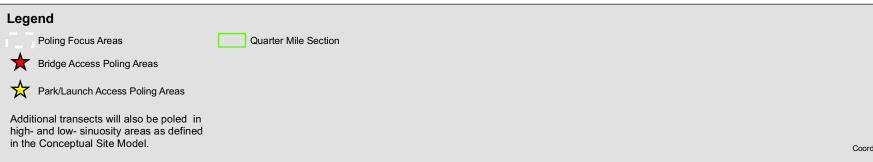


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ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





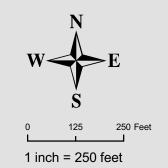


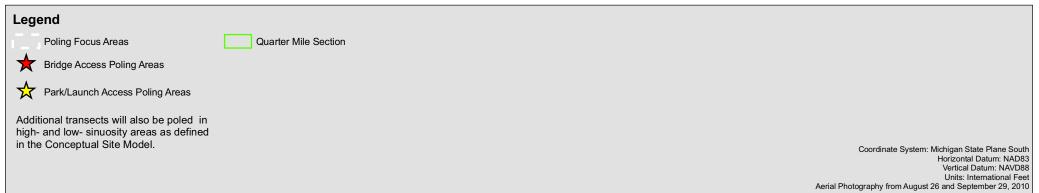
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2011 POLING FOCUS AREAS MP27.50-MP28.00

**ENBRIDGE LINE 6B RESPONSE** KALAMAZOO AND CALHOUN COUNTIES MICHIGAN

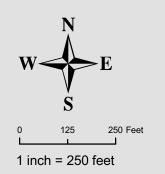






ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN Apr 06, 2011





### Legend

Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas



Park/Launch Access Poling Areas

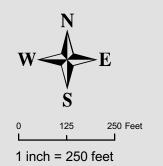
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP29.00-MP29.75

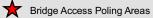
ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Poling Focus Areas

Quarter Mile Section





Park/Launch Access Poling Areas

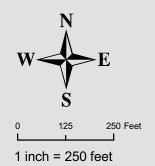
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP29.75-MP30.50

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Bridge Access Poling Areas

### Legend

Poling Focus Areas

Quarter Mile Section

Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

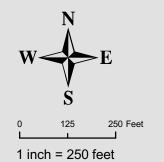
2011 POLING FOCUS AREAS MP30.50-MP31.00

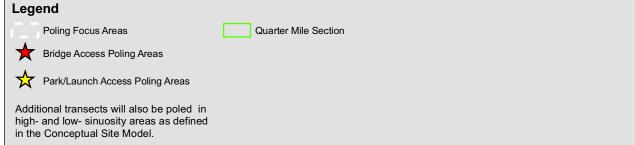
ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN

Apr 06, 2011



TETRATECH EC, INC.

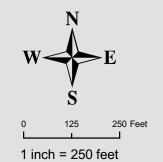




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ENBRIDGE LINE 6B RESPONSE
KALAMAZOO AND CALHOUN COUNTIES
MICHIGAN



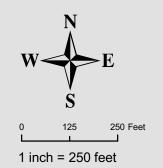


# Legend Poling Focus Areas Quarter Mile Section Bridge Access Poling Areas Park/Launch Access Poling Areas Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model. Coordinate Systems

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP31.50-MP32.00 ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN Apr 06, 2011





### Legend

Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

Park/Launch Access Poling Areas

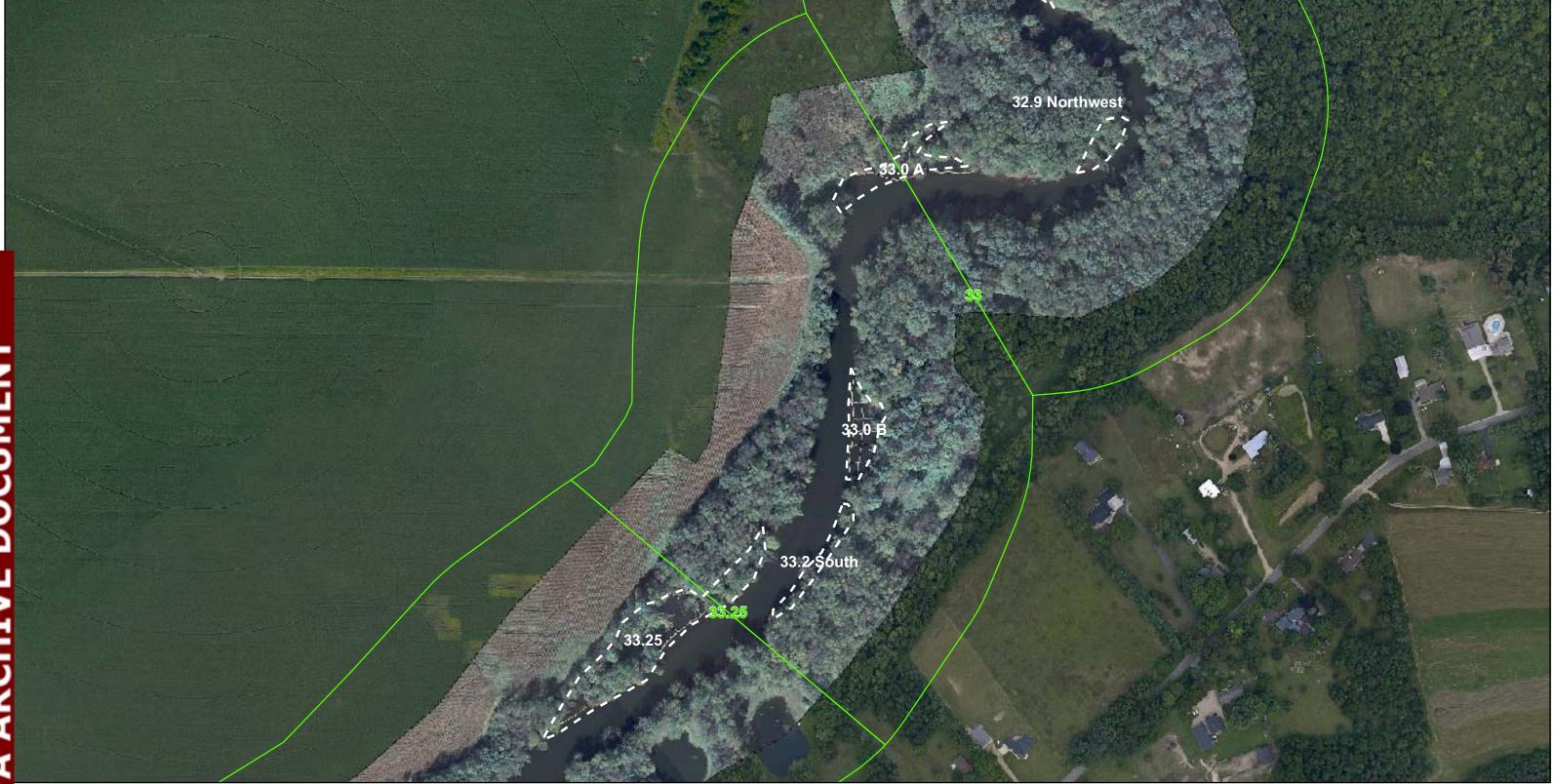
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

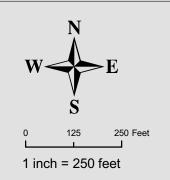
Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP32.00-MP33.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN







Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

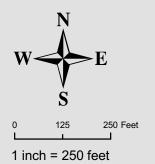
Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP32.75-MP33.50

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN

Apr 06, 2011



TETRATECH EC, INC.



Poling Focus Areas

Bridge Access Poling Areas

Quarter Mile Section

Park/Launch Access Poling Areas

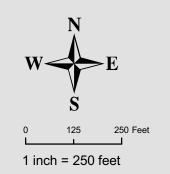
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP33.50-MP34.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

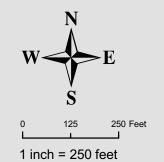
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP34.00-MP35.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Poling Focus Areas

Bridge Access Poling Areas



Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

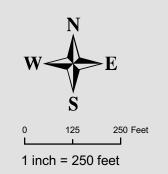
Quarter Mile Section

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP35.00-MP35.75

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

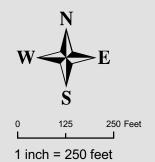
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010 2011 POLING FOCUS AREAS MP35.75-MP36.75

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

Park/Launch Access Poling Areas

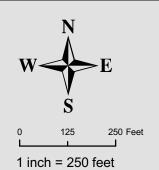
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

MP36.75-MP37.50

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Poling Focus Areas

Poling Focus Areas

Bridge Access Poling Areas

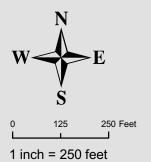
Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN





Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

Park/Launch Access Poling Areas

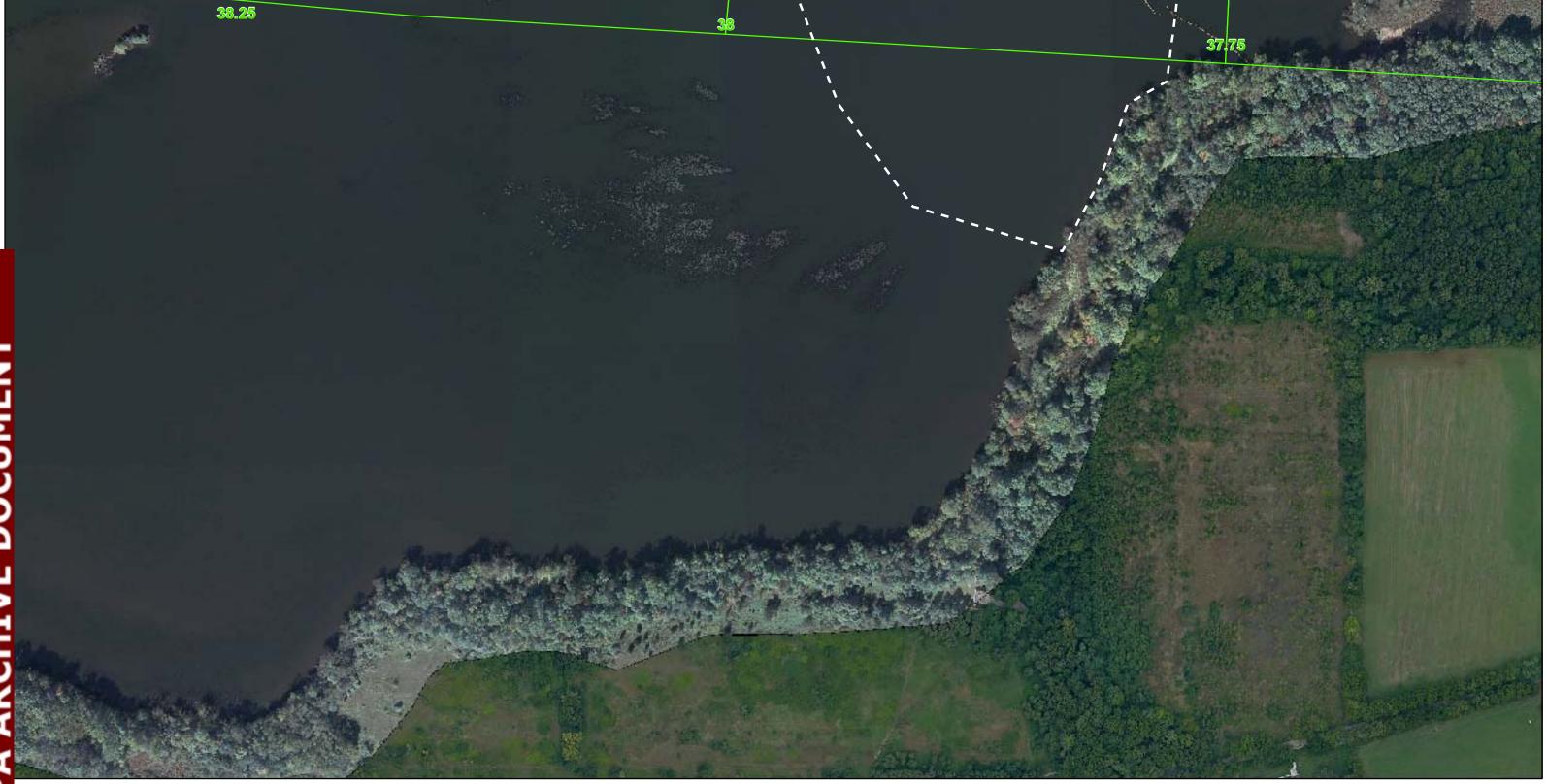
Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

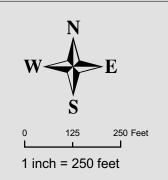
Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP37.50-MP38.25N

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN









Poling Focus Areas

Bridge Access Poling Areas

Quarter Mile Section

Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

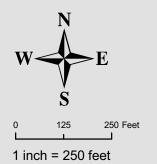
2011 POLING FOCUS AREAS MP37.50-MP38.25S

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN

Apr 06, 2011



TETRATECH EC, INC.



Poling Focus Areas

Bridge Access Poling Areas

Park/Launch Access Poling Areas

Quarter Mile Section

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

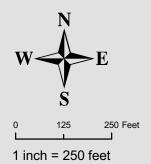
2011 POLING FOCUS AREAS MP 38.25-MP 39.0N

**ENBRIDGE LINE 6B RESPONSE** KALAMAZOO AND CALHOUN COUNTIES MICHIGAN

Apr 06, 2011



TETRATECH EC, INC.



Poling Focus Areas

Quarter Mile Section

Bridge Access Poling Areas

Park/Launch Access Poling Areas

Additional transects will also be poled in high- and low- sinuosity areas as defined in the Conceptual Site Model.

Coordinate System: Michigan State Plane South Horizontal Datum: NAD83 Vertical Datum: NAVD88 Units: International Feet Aerial Photography from August 26 and September 29, 2010

2011 POLING FOCUS AREAS MP39.50-MP40.00

ENBRIDGE LINE 6B RESPONSE KALAMAZOO AND CALHOUN COUNTIES MICHIGAN



# **US EPA ARCHIVE DOCUMENT**

### **2011 Poling Assessment**



	Approximate	Minimum Number of Poling Locations to	Approximate Number of Addititonal Poling Locations if	J 4:5:
Poling Area	Area (acres)	Assess Area <sup>1</sup>	Delineation Required <sup>2</sup>	Justification <sup>3</sup>
Talmadge Creek - Source to I-69	1.12 miles <sup>4</sup>	66	NA <sup>5</sup>	PA, OM, MH, PD
Talmadge Creek - I-69 to 15.5 Mile Rd	0.10 miles <sup>4</sup>	9	NA <sup>5</sup>	PA, OM, MH, PD
Talmadge Creek - 15.5 Mile Rd to Confluence	0.74 miles <sup>4</sup>	54	NA <sup>5</sup>	PA, OM, MH, PD
Talmadge Creek - Kalamazoo River Confluence	0.1	6	3	PA, OM, MH, PD
2.3 North	0.5	6	5	PD
2.35 South	0.5	6	4	PD
2.50 North	0.3	4	4	PD
2.55 North	0.2	4	4	OM, MH, PD
2.60 North	0.3	6	5	OM, MH, PD
2.75	0.2	6	4	OM, MH, PD
2.80 South	0.4	6	5	OM, MH, PD
2.90 South A	0.1 0.1	4	4	OM, MH, PD
2.90 South B		4	4	MH, PD
3.15 South	0.2	4		OM, MH, PD
3.3 South A	0.1	4	4	OM, MH, PD
3.25 R1	0.7	8	3	OM, MH, PD
3.3 South B 3.45 North	0.2	4	4	OM, MH, PD
	0.3	6	3	PD PD
3.5 South	0.3	4	5	
3.6 South	0.2	4	5 6	OM, MH, PD OM, MH, PD
3.75 South	0.6	6		
4.15 South	2.1	8	8	OM, MH, PD
4.15 North 4.3 South	0.1 1.9	3 8	3 11	MH, PD OM, MH, PD
		4		PD
4.6 Center 4.9 North	0.3	3	5 3	OM, MH, PD
4.9 South	0.1	4	4	OM, MH, PD
5.25 North	0.3 1.2	6		
5.25 South	1.0	6	9 5	OM, MH, PD MH, PD
5.25 South 5.35 North	0.3	4	4	MH, PD
5.63 South	1.3	12	8	PA, OM, MH, PD
5.75 South	3.1	15	10	PA, OM, MH, PD
5.75 North/5.55 North	3.7	24	20	PA, OM, MH, PD
5.8 South	0.1	6	4	PA, OM, MH, PD
5.8 North	0.1	6	4	PA, OM, MH, PD
5.9 South A	<0.1	3	3	MH, PD
5.9 South B	<0.1	3	3	MH, PD
5.9 North	0.1	3	3	OM, MH, PD
6.1 North	0.3	6	5	PD
6.2 South	0.3	3	3	OM, MH, PD
6.25 South	0.1	3	3	MH, PD
6.25 North	1.0	8	5	MH, PD
6.45 North A	0.2	4	4	OM, MH, PD
6.45 North B	0.1	3	4	MH. PD
6.7 North	0.1	3	3	MH, PD
6.75 South	0.2	4	4	OM, MH, PD
7.0 R1	0.1	3	3	OM, MH, PD
7.0 South	1.9	10	8	PA, OM, MH, PD
7.35 Center	0.2	4	5	PD
7.45 North	0.2	4	4	PD
7.55 South	0.1	4	4	MH, PD
7.65 North	0.3	6	4	PD
7.75	0.8	10	7	PA, OM, MH, PD
8.05 Center	0.1	3	5	PD
8.25 Islands	4.0	12	12	PD
8.5 L1/L2	0.2	4	6	OM, MH, PD
8.6 North	0.1	4	4	PD
8.75 North	1.0	8	6	PD
8.95 South	0.6	6	6	OM, MH, PD
9.15 South	0.2	5	7	PD
9.35 Center	0.5	5	7	PD
9.5 North	<0.1	3	3	PD
9.65 North	0.2	4	4	PD
9.75 South	1.1	10	6	PD
10.0 Center	0.2	4	5	PD
10.2 South	0.2	5	5	PD

# **US EPA ARCHIVE DOCUMENT**

### **2011 Poling Assessment**



	Approximate	Minimum Number of Poling Locations to	Approximate Number of Addititonal Poling Locations if	2
Poling Area	Area (acres)	Assess Area <sup>1</sup>	Delineation Required <sup>2</sup>	Justification <sup>3</sup>
10.25 North	0.2	4	4	PD
10.4 North	0.1	3	3	PD
10.5 North	0.5	6	5	PD
10.5 L2	0.3	6	5	OM, MH, PD
10.65 North	0.4	6	4	MH, PD
10.75 L2	0.4	6	5	OM, MH, PD
10.8 South 10.8 North	0.5 <0.1	<u>6</u> 3	6 3	PD PD
10.95 North	0.1	3	3 4	PD
11.0 North	0.1	4	5	PD
11.2 South	0.3	4	6	PD
11.4 South	0.8	8	7	PD
11.75 South	0.0	3	3	PD
11.75 R1	0.1	3	3	OM, MH, PD
11.8 North	0.2	4	4	MH, PD
12.35 South	0.2	4	5	PD
12.5	3.0	15	6	PA, OM, MH, PD
12.7 South	0.1	3	3	MH, PD
12.7 North	0.1	4	4	PD
13.15 North	0.2	4	6	MH, PD
13.25 North	0.2	4	4	MH, PD
13.45 South	0.3	5	5	PD
13.5 L1	0.2	4	4	OM, MH, PD
13.6 North	0.1	3	4	MH, PD
13.6 South	0.1	4	4	PD
13.7 North	0.2	4	4	PD
13.8 South	0.5	6	8	OM, MH, PD
13.85 North	0.4	5	5	PD
13.95 North	0.1	4	4	MH, PD
14.2 South	0.3	4	4	MH, PD
14.35 North	0.4	4	6	MH, PD
14.6 South	0.1	3	5	MH, PD
14.75	1.4	8	5	PA, OM, MH, PD
14.8 South	<0.1	3	3	MH, PD
14.9 South	1.2	10	8	OM, MH, PD
15.05 South	0.5	6	7	MH, PD
South Mill Pond	9.0	24	8	PA, OM, MH, PD
North Mill Pond	4.3	24	8	PA, OM, MH, PD
15.25	0.2	4	5	OM, MH, PD
15.4	0.2	4	4	PD
15.6	1.5	6	6	PD
18.15 South	0.5	6	6	OM, MH, PD
18.5 South	1.0	6	7	OM, MH, PD
18.65 South	0.7	4	7	MH, PD
18.65 North	<0.1	3	3	MH, PD
18.8 Center	1.8	8	10	OM, MH, PD
18.85 North	<0.1	3	3	MH, PD
18.95 North	0.1	3	3	MH, PD
19.0 Center	0.1	3	5	MH, PD
19.15 South	0.1	3	5	MH, PD
19.25 South	0.2	4	4	PD
19.25 L1	1.1	8	5	OM, MH, PD
19.45 North	0.2	3	4	OM, MH, PD
19.5 North	<0.1	3	3	MH, PD
19.6 South	1.9	8	11	OM, MH, PD
19.85 South	0.1	3	4	MH, PD
20.1 South	2.3	10	11	OM, MH, PD
20.3 South	0.1	3	4	OM, MH, PD
20.6 South	0.2	3	3	OM, MH, PD
20.7 North	0.4	4	6	OM, MH, PD
20.9 South	0.1	3	3	OM, MH, PD
21.25 North	0.9	6	5	OM, PD
21.4	4.2	12	6	PD
21.5 R1	3.9	16	6	PA, OM, MH, PD
21.55 South	0.8	8	5	MH, PD
22.0 South	1.0	8	5	PD

# **US EPA ARCHIVE DOCUMENT**

### **2011 Poling Assessment**



		Minimum Number of	Approximate Number of	
L	Approximate	Poling Locations to	Addititonal Poling Locations if	1
Poling Area	Area (acres)	Assess Area <sup>1</sup>	Delineation Required <sup>2</sup>	Justification <sup>3</sup>
22.15 South	0.3	4	5	OM, MH, PD
22.2 North	0.2	4	3	OM, MH, PD
22.25 North	0.2	3	3	PD
22.4 North	0.2	3	4	PD
22.5 West	1.1	8	8	PD
22.75 North	1.2	8	4	OM, PD
23.0 South	0.7	6	6	PD
23.15 North	0.2	4	4	OM, MH, PD
23.85 North	0.7	6	5	PD
24.65 South	0.2	4	4	PD
24.75 North	1.1	6	8	OM, PD
25.65 North	<0.1	3	3	PD
25.7 North	0.3	4	4	PD
25.85 North	0.2	4	5	PD
26.0	0.9	8	5	PA, OM, MH, PD
26.1 Southeast	0.1	4	4	OM, MH, PD
26.2 South	<0.1	3	3	MH, PD
26.25	1.2	8	6	PA, OM, MH, PD
26.3 Northwest	0.4	5	6	OM, PD
26.4 Center	0.1	3	5	OM, MH, PD
26.65	0.3	6	5	PA, OM, MH, PD
26.8 Southeast	0.2	4	6	OM, MH, PD
27.1 North	0.1	3	3	OM, MH, PD
27.1 South	0.1	3	3	OM, MH, PD
27.15 South	0.1	3	3	OM, MH, PD
27.3 North	0.1	3	4	OM, MH, PD
27.3 South	0.1	3	3	OM, MH, PD
27.5 Southeast A	0.3	4	4	MH, PD
27.5 Southeast B	0.3	4	4	OM, MH, PD
27.5 Northwest	0.1	3	4	MH, PD
27.55 Northwest	0.6	6	6	PD
27.65 North	0.2	3	4	OM, MH, PD
27.65 South	0.1	4	5	OM, MH, PD
27.7 North	0.1	4	3	PD
	0.1	3	3	MH, PD
27.85 North	l l			
27.9	0.3	4	4	PA, OM, MH, PD
28.15 South	0.2	4	5	OM, MH, PD
28.25	1.6	16	5	PA, OM, MH, PD
28.45 South	0.2	4	3	OM, MH, PD
28.5 North	0.1	3	3	OM, MH, PD
28.5 South	0.2	4	3	OM, MH, PD
28.6 North	0.3	4	5	OM, MH, PD
28.75 North	0.1	3	3	OM, MH, PD
28.75 South	0.1	4	5	OM, MH, PD
28.8 North	0.1	3	3	OM, MH, PD
28.9 South	<0.1	3	3	OM, MH, PD
29.05 South	0.1	3	3	MH, PD
29.1 North	0.8	8	4	MH, PD
29.15 North	0.2	4	5	OM, MH, PD
29.5 North	0.2	4	5	OM, MH, PD
29.5 South	0.2	3	3	OM, MH, PD
29.75 North	0.2	3	4	MH, PD
30.0	0.2	4	3	OM, MH, PD
30.05 North	0.6	6	5	MH, PD
30.3 North	0.2	3	3	OM, MH, PD
30.65 North	0.1	3	3	MH, PD
30.7 North	0.3	6	5	MH, PD
30.8 South	1.1	8	6	OM, MH, PD
31.0	0.1	3	3	OM, MH, PD
31.25 North	0.6	4	6	OM, MH, PD
31.3 Southeast	0.1	3	3	OM, MH, PD
31.6 North	0.3	4	5	OM, MH, PD
31.6 Southeast	0.8	6	6	MH, PD
31.8 South	8.8	24	12	OM, MH, PD
32.5 North	0.3	4	5	MH, PD
32.65 Southeast	0.3	3	3	MH, PD
32.03 30uii ieasi	U. I	J	J	IVII I, FU

### **2011 Poling Assessment**



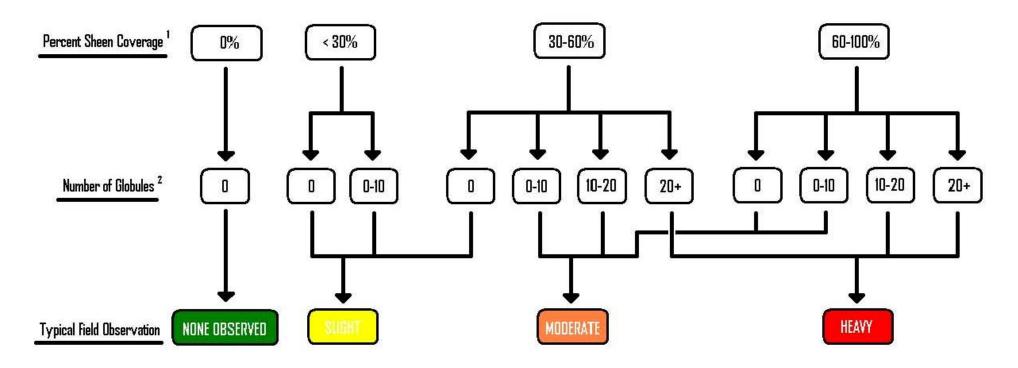
	Approximate	Minimum Number of Poling Locations to	Approximate Number of Additional Poling Locations if	3
Poling Area	Area (acres)	Assess Area <sup>1</sup>	Delineation Required <sup>2</sup>	Justification <sup>3</sup>
32.75 Northwest	0.3	4	6	OM, MH, PD
32.75 Southeast	0.2	4	5	MH, PD
32.9 Northwest	0.2	4	5	PD
33.0 A	0.5	6	6	PA, OM, MH, PD
33.0 B	0.4	8	6	PA, OM, MH, PD
33.2 South	0.2	4	6	MH, PD
33.25	1.6	8	10	PA, OM, MH, PD
33.5 North	0.3	4	7	OM, MH, PD
33.5 South	0.5	4	8	OM, MH, PD
33.65 North	0.3	3	4	MH, PD
33.75 North	0.2	3	5	OM, MH, PD
34.0	1.3	8	9	OM, MH, PD
33.95 South	0.2	4	4	MH, PD
34.2 Southeast	0.2	3	4	MH, PD
35.1 North	1.1	7	10	PD
35.3 North	0.7	6	9	PD
35.6 Northwest	0.5	5	7	PD
35.6 Southeast A	0.5	4	6	OM, MH, PD
35.6 Southeast B	0.5	6	6	MH, PD
35.8 Northwest	0.5	6	4	OM, MH, PD
36.1 Northwest	0.6	6	4	OM, MH, PD
36.15 North	0.4	4	4	MH, PD
36.25	2.3	10	8	PA, OM, MH, PD
36.45 North	1.8	10	5	MH, PD
36.5	0.3	4	5	OM, MH, PD
36.6 South	1.4	10	9	OM, MH, PD
36.8 North	0.6	4	6	OM, MH, PD
Morrow Lake Delta East	47.2	120	80	PA, OM, MH, PD
Morrow Lake Delta South	1.8	12	12	PA, OM, MH, PD
Morrow Lake Delta West	1.1	9	12	PA, OM, MH, PD
37.75 North	0.6	6	7	PA, OM, MH, PD
Entrance to Morrow Lake	29.5	16	20	MH, PD
Totals:	213 <sup>6</sup>	1490	1249 <sup>7,8</sup>	

### Notes:

- 1. Increase in the number of poling locations subject to field conditions.
- 2. Delineation required if moderate or heavy sheen is observed. Number of poling locations subject to field conditions.
- 3. PA = 2010 Priority Area
  - OM = Operations & Maintenance Site
  - MH = Moderate or Heavy Submerged Oil in 2010
  - PD = Potential Deposition Area
- 4. Approximate acreage not determined due to scale. Value listed is river length.
- 5. NA = Not Applicable
  - Area may consist of a large subset of delineations.
- 6. Total acreage does not include Talmadge Creek Source to Confluence. The river length of this segment is 1.96 miles.
- 7. Value does not include approximate additional delineation poling loctions from Talmadge Creek Source to Confluence.



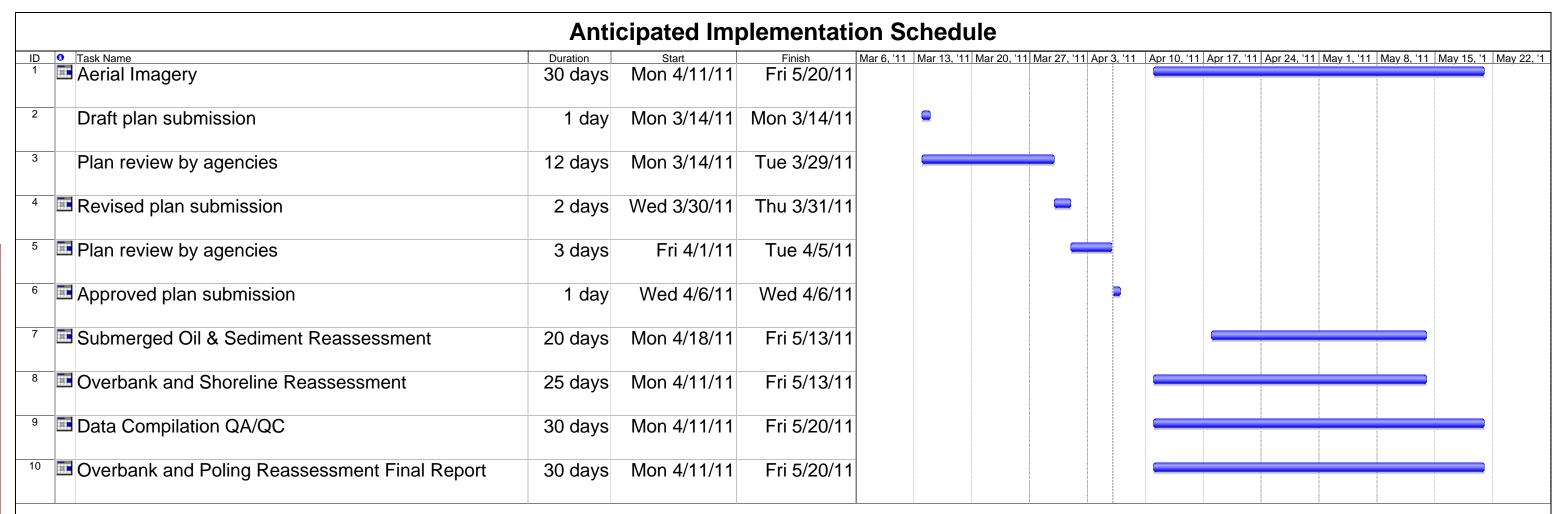
## Submerged Oil Field Observation Flowchart



### Notes:

- 1. Percent coverage of 1 square yard
- 2. Number of globules per square yard

## ATTACHMENT B



Project: Tentative Overbank and Poling Reassessment Schedule Date: March 31, 2011

Task Progress Summary Project Summary Project Summary Project Summary External Tasks Deadline Factorial Milestone ♦

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